NExT PhD Workshop 2026 SEPnet Biographies

Declan Millar is a Research Scientist at IBM Research, based at Hursley in Hampshire, UK. IBM Research is IBM's global research division focusing on semiconductors, artificial intelligence, quantum computing, and hybrid cloud.
He completed his PhD in theoretical particle physics jointly at the University of Southampton and Queen Mary University of London. His thesis explored the phenomenology of beyond-the-Standard-Model signals in top quark pair production.
He joined IBM directly after finishing his PhD in 2018, initially as a Software Engineer. After one year he moved to IBM Research, contributing to AI algorithm research before moving into quantum computing. His current research is focused on quantum algorithms for simulating physical systems, particularly in condensed matter and high-energy physics.
The role draws on scientific programming (primarily Python), numerical methods and high-performance computing, algorithm design, theoretical physics, and quantum information theory. It involves extensive collaboration: engaging with internal teams and with academic, government, and industrial partners to produce internal IP, open-source software packages, and peer-reviewed publications.

Alex Titterton is a Machine Learning Engineering Manager at Graphcore, a Bristol-based chip company working on the future of Artificial Intelligence compute. A physicist at heart, he began his PhD in 2015, jointly appointed by the University of Southampton (NExT), Rutherford Appleton Laboratory and the University of Bristol, where he worked on phenomenology and experimental searches for NMSSM signatures with the CMS experiment at CERN. He joined Graphcore upon completion of his PhD in 2019, working with various research institutions and leading a team within the Applied AI division.

Alexander (Alex) Liptak is a Beamline Scientist at the I12-JEEP beamline at Diamond Light Source. He completed a Fusion CDT PhD at the University of Liverpool, where his research focused on statistical and molecular dynamics models of plasma–surface interactions in nuclear fusion reactors. During his undergraduate studies in Theoretical Physics at Royal Holloway University of London, Alex worked part-time as an IT Support Assistant and as a Disability and Dyslexia Student Helper, alongside completing three summer internships, including two through SEPnet at the OffSpec beamline at ISIS and the I14 beamline at Diamond. The connections he developed through these experiences led to his Master's project at the IMAT beamline at ISIS, where he developed Bragg-edge imaging software for the neutron community and published his work. Unsure whether to continue in neutron imaging or pursue his interest in quantum computing, Alex chose to undertake a PhD in nuclear fusion. After completing his PhD, he returned to imaging as a Support Scientist at the I12-JEEP beamline at Diamond Light Source, working again with his Master's project supervisor. He was subsequently promoted to Beamline Scientist and has since had the opportunity to supervise his first SEPnet student. In his current role, Alex is responsible for maintaining the beamline and supporting external researchers from universities and industry around the world in carrying out experiments at the facility. His own research mainly focuses on developing techniques to improve the capabilities of the beamline. His role requires a broad knowledge of physics, chemistry, engineering and related scientific disciplines, together with expertise in optics, photonics, imaging and high-energy photon–particle interactions. He also uses a range of programming languages, algorithms and high-performance computing techniques for data processing, alongside strong communication, creative thinking, problem-solving and experimental planning skills.

Mohammad Abdul Rehman Waris is a PhD researcher in Particle Physics at Queen Mary University of London (QMUL), working with the ATLAS experiment at CERN. His PhD research focuses on a precision

measurement of one of the fundamental parameters of the Standard Model, the weak mixing angle, using angular coefficients in Drell–Yan processes measured with the ATLAS detector.

Mohammad's career has followed an interdisciplinary path across engineering, physics, data science and industry. Originally trained as a mechanical engineer, his interest in fundamental physics subsequently led him to complete an MSc in Theoretical Physics at Utrecht University, where his research focused on the thermodynamics and hydrodynamics of non-conformal quark–gluon plasma using holographic methods.He later completed an MSc in Data Science and Society at Tilburg University, specialising in high-energy physics through research at Nikhef (Dutch institute for subatomic physics). Alongside his academic work, he gained industry experience in the Netherlands as a Developer and Data Analyst at KPMG, working on data-driven software, analytics and process automation, and later as a Data Science Consultant at the Rabobank, where he worked on transaction-monitoring and anti-financial-crime applications. His decision to return to academia was motivated by a longstanding interest in fundamental physics. In his current PhD, he works with large collider datasets, statistical analysis, scientific software and precision measurements within the ATLAS collaboration.

Mohammad is also currently undertaking a placement at the UK Atomic Energy Authority (UKAEA), working on accelerating simulations of rarefied gas flows for tokamak design, bringing together physics modelling, numerical computation and machine learning.

Souad Semlali is a researcher working mainly on the phenomenology of extended scalar sectors ((i.e., (N)2HDM, TRSM, (N)MSSM ..). After completing her PhD, she worked as a science teacher while continuing her research. She is currently a Postdoctoral Research Associate at the University of Southampton, based at the Rutherford Appleton Laboratory (RAL-PPD) and working within the NExT Institute. Alongside her research, she recently completed her secondary science teacher training with OTT-SCITT and is due to start a part-time teaching position. Her current career combines both academia and education, allowing her to remain involved in particle physics research while also teaching physics in secondary education.